

REMARKS

Claims 1-8 and 10-23 are pending in this application. By this Amendment, claim 9 is cancelled and claims 1, 8, 16 and 19 are amended. Attached hereto is a marked version of the changes to the claims by the current amendment. The attachment is captioned "Version with markings to show changes made."

The Office Action rejects claims 1-23 under 35 U.S.C. §101. The Office Action appears to assert as its basis that each of the claims recites merely a mental function as opposed to manipulative states. This is clearly incorrect. For example, independent claim 1 recites analyzing characteristics of signals and determining a second orientation based on the analyzed characteristics. For example, as discussed with respect to Figure 6, a simulation may be performed on signal traces that will propagate along the signal traces. The results of the simulation may be analyzed in block 606. As such, independent claim 1 does not relate to purely mental functions. Furthermore, current case law states that claims comply with 35 U.S.C. §101 when data is taken through a series of mathematical calculations to determine a useful, concrete and tangible result. The question of whether a claim encompasses statutory subject matter relates to practical utility. See State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 47 U.S.P.Q. 2D (BNA) 1596 (Fed. Cir. 1998). It is respectfully submitted that the original claims fully comply with 35 U.S.C. §101 because a useful, concrete, and tangible result may occur based on the claimed method. Additionally, the subject matter has practical utility in that it relates to designing of printed circuit boards, for example.

However, in order to further prosecution, independent claim 1 is amended to recite designing the structure having the first plurality of conductive paths arranged in the first orientation and the second plurality of conductive paths in the determined second orientation. Independent claim 8 is amended to recite designing the printed circuit board having the first plurality of relatively parallel conductive paths and the second plurality of relatively parallel conductive paths. Independent claim 16 is amended to recite designing a structure to have the first pattern and the second pattern. It is respectfully submitted that the designing of the structure as recited in independent claim 1 (and as similarly recited in the other independent claims) fully complies with 35 U.S.C. §101 to provide a useful, concrete and tangibly result. The subject matter also has practical utility. The rejection based on 35 U.S.C. §101 should be withdrawn.

The Office Action rejects claims 1-23 under 35 U.S.C. §103(a) over Japanese Patent No. 07-245575 by Takeshi. The Office Action also rejects claims 1-23 under 35 U.S.C. §103(a) over Japanese Patent No. 2000-244133 by Masano (hereafter Masano). The rejections are respectfully traversed.

Independent claim 1 recites analyzing characteristics of signals passing along a first plurality of conductive paths arranged in a first orientation and determining a second orientation for a second plurality of conductive paths based on the analyzed characteristics. Independent claim 1 further recites designing the structure having the first plurality of conductive paths arranged in the first orientation and the second plurality of conductive paths in the determined second orientation.

Takeshi does not teach or suggest all of the features of independent claim 1. That is, Takeshi does not teach or suggest analyzing characteristics of signals passing along a first plurality of conductive paths arranged in a first orientation. For example, as discussed in the present application, a simulation may be performed on single traces based on anticipated signals that may propagate along the signal traces in actual operation. The results of the simulation (such as push-out and pull-in) may be analyzed. See page 13, lines 6-8 of the present specification, for example. Takeshi merely discloses revising the arrangement order of parallel transmission lines so as to revise a part or all the signal arrangement order among plural signals to be transmitted. Takeshi does not teach or suggest analyzing characteristics and determining a second orientation for a second plurality of conductive paths based on the analyzed characteristics.

Additionally, dependent claim 2 recites that the characteristics comprise timing relationships of signals across the first plurality of conductive paths. Dependent claim 3 further recites that timing relationships relate to one of push-out and pull-in of signal timings. Takeshi does not disclose these features. Applicant also notes that Takeshi is provided as a one page English-language Abstract (of a Japanese language version of the original publication). Therefore, applicant is unable to comment on the disclosure of the Japanese language text. Further, the Office Action appears to suggest that Takeshi may not actually teach analyzing characteristics of the signals. See the Office Action's language of "[I]f in fact the '575 fails to teach ... analyzing characteristics of signals." The Office Action then suggests it may have been obvious for an artisan for perform this

step which would allow the minimization of crosstalk between parallel conductors or paths. However, the Office Action does not provide any reference that shows analyzing characteristics of signals. As such, there is no showing in the prior art of these features and therefore there can not be any suggestion to combine these non-disclosed features with Takeshi's arrangement. Should the Patent Office maintain a rejection based on Takeshi in view of non-disclosed features, the Patent Office is requested to provide a prior art reference showing this feature as well as provide motivation to make the combination.

Additionally, Takeshi clearly does not teach or suggest the features of dependent claim 7, namely that the first plurality conductive paths comprise a first plurality of vias coupling a first layer of a printed circuit board to a second layer of a printed circuit board and the second plurality of conductive paths comprise a second plurality of vias coupling the first layer of the printed circuit board to the second layer of the printed circuit board. The Office Action does not address these features and it is believed that Takeshi does not teach or suggest these features.

Similarly, Masano does not teach or suggest all the features of independent claim 1. Masano shows a multi-layer wiring board having a first laminate D1 and a second laminate D2. The directions of the wirings on the different laminates are different. However, these laminates are provided as such in order to connect terminals by as nearly a short distance as possible. See Masano's "Problem To Be Solved" section. Masano also does not teach or suggest analyzing characteristics of signals passing along a first plurality conductive paths arranged in the first orientation as recited

in independent claim 1. As such, Masano does not teach or suggest determining a second orientation based on the analyzed characteristics.

Further, the Office Action appears to suggest that Masano may not actually teach analyzing characteristics of the signals. See the Office Action's language of "[I]f in fact the '133 fails to teach ... analyzing characteristics of signals." The Office Action then suggests it may have been obvious for an artisan for perform this step which would allow the minimization of crosstalk between parallel conductors or paths. However, the Office Action does not provide any reference that shows analyzing characteristics of signals. As such, there is no showing in the prior art of these features and therefore there can not be any suggestion to combine these non-disclosed features with Masano's arrangement. Should the Patent Office maintain a rejection based on Masano in view of non-disclosed features, the Patent Office is requested to provide a prior art reference showing this feature as well as provide motivation to make the combination.

For at least the reasons set forth above, independent claim 1 defines patentable subject matter. Each of independent claims 8 and 16 define patentable subject matter for at least similar reasons as claim 1. In addition, the dependent claims also recite features that further and independently distinguish over the applied references. For example, the applied references do not teach or suggest the timing relationships of signals across the first plurality of conductive paths as recited in dependent claim 2 (and similarly recited in dependent claims 10 and 17). Additionally, the applied references do not teach or suggest that the timing relationship relate to one of push-out and pull-in of

signal timings as recited in dependent claim 3 (and similarly recited in dependent claims 11 and 18). Additionally, as set forth above, the applied references do not teach or suggest all the features of dependent claim 7 (and similarly dependent claims 15 and 23). Each of dependent claims 2, 3, 7, 10, 11, 15, 17, 18 and 23 define patentable subject matter at least for this additional reason.

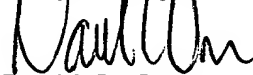
For at least the reasons set forth above, each of claims 1-8 and 10-23 defines patentable subject matter. Withdrawal of the outstanding rejection is respectfully requested.

CONCLUSION

In view of the foregoing, it is respectfully submitted that the above-identified application is in condition for allowance. Favorable consideration and prompt allowance of claims 1-8 and 10-23 is earnestly solicited.

To the extent necessary, applicant petitions for an extension of time under 37 C.F.R. §1.136. Please charge any shortage in the fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 01-2135 (Case No. 219.40419X00) and please credit any excess fees to such deposit account.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Claims 1, 8, 16 and 19 have been amended as follows:

1. (Amended) A method comprising:

analyzing characteristics of signals passing along a first plurality of conductive paths arranged in a first orientation; ~~and~~

determining a second orientation for a second plurality of conductive paths based on said analyzed characteristics; and

designing the structure having the first plurality of conductive paths arranged in the first orientation and the second plurality of conductive paths in the determined second orientation.

8. (Amended) A method of designing a printed circuit board comprising:

analyzing at least one characteristic of a first plurality of relatively parallel conductive paths on said printed circuit board, said first plurality of relatively parallel conductive paths being arranged in a pattern in a first area of said printed circuit board; ~~and~~

rearranging said pattern of conductive paths based on the analyzed at least one characteristic such that a second plurality of relatively parallel conductive paths in a second area of said printed circuit board have a different geometry with respect to one another as compared to a geometry of said first plurality of relatively parallel conductive paths in said first area; and

designing the printed circuit board having the first plurality of relatively parallel
conductive paths and the second plurality of relatively parallel conductive paths.

16. (Amended) A method comprising:
analyzing a characteristic of a first plurality of conductive paths arranged in a first
pattern; and
altering said characteristic by rearranging said pattern to form a second pattern;
and
designing a structure to have said first pattern and said second pattern.

19. (Amended) The method of claim 16, wherein altering said characteristic
comprises determining a the second pattern for a second plurality of conductive paths
based on said analyzed characteristic.